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Statistical Analysis of Cohesion Funding in the Czech Republic

Karel Mirošník[a], Ludmila Petkovová[a], Jan Čadil[a,b,*]

[a]*University of Economics, Prague, W. Churchill Sq. 4,130 67 Prague 3, Czech Republic*
[b]*Banking Institute Research Centre, Narozni 2600/9, 158 00 Prague 5, Czech Republic*

Abstract

Recent debt crisis in several European countries has triggered a debate concerning the government debt sustainability and management. One of the important topics is the question of public expenditures and their efficiency. This is applied not only on national but also on the EU level, namely regarding the Cohesion Policy and funding. It is without doubt that evaluating the efficiency of cohesion funding is going to be one of the key elements of the Cohesion Policy implementation in near future. However, to perform proper evaluation and use modern methods it is necessary to have a robust and complex database which allows researchers and policy makers to utilize modern data-demanding methods. Although there are many data sources in the Czech Republic there is no single complex database covering all cohesion expenditure. The data are scattered through various institutions and programs and the outcome is blurred. The intention of this article is to introduce a complex data source concerning cohesion funding in the Czech Republic based on authors´ original research. It provides a descriptive statistics and basic statistical analysis of the data which bring quite interesting results regarding the cohesion funding properties.

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* Corresponding author.
E-mail address: jcadil@bivs.cz

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1. Introduction

The Cohesion Policy is one of the key elements of the European integration process. Its main purpose is to promote economic growth and speed up the economic convergence among EU member states and regions (European Communities 2006). The importance of the Cohesion Policy and its funding has been rapidly increasing during last two decades. Today it is the most important EU joint policy (expressed in financial means), along with the Common Agricultural policy. In the previous programming period 2007–2013 more than one third of EU budget, 35.7 %, was planned for structural operations (European Communities 2007). It was no surprise that in hand with gaining more financial means the Cohesion Policy has become widely analyzed and discussed. Especially since the beginning of programming period 2000–2006[1] until now we have found lots of various researches and analyses dealing mainly with the impact of the Cohesion Policy (or Structural Funds as its tools) on convergence and growth, questioning its effectiveness. Despite prevailing, albeit mainly political, persuasion that the Cohesion Policy promotes convergence and growth, the outcomes of these researches are not so straightforward. Although there are many studies pointing at a positive impact of the Cohesion Policy on regional convergence and growth, finding it effective (Busillo et. al, 2010; Beugeldsdijk and Eijffiger, 2005 or Venables and Gasiorek, 1999) there are also many critical ones. For example Ederveen et al. (2006) came to the conclusion that the Cohesion Policy is generally ineffective among the 13 selected EU member states but individually effective – depending mainly on institutional quality and good governance. Boldrin and Canova (2001) found no convergence in income per capita terms among 185 NUTS 2 regions, Dall'erba and Le Gallo (2008) emphasize the emergence of core-periphery pattern over period 1989–1999. Regarding the Cohesion Policy (Objective 1) they found no positive effect on regional growth.

Within these critical otcomes we may also find ideas to distinguish between convergence and cohesion when cohesion should be the purpose of the Cohesion Policy according to some researchers (Bachtler and Gorzelak 2007)[2]. Also we find critique of critical papers like Bradley and Untied (2008) who questioned Ederveen et al (2006, 2002) mainly on methodological grounds. All in all, the situation related to the Cohesion Policy effectiveness is still fairly inconclusive[3]. We cannot proclaim with absolute certainty the Cohesion Policy to be efficient and convergence promoting, neither we may say the opposite. However, even the possibility of ineffectiveness itself is quite harmful for the Cohesion Policy. Especially in relation to recent financial crisis and risen problem of public debt, the public funding in any manner becomes sharply assessed. The Cohesion Policy is no exception. The question of effectiveness then has probably become more important than ever.

Regarding the analytical approaches to evaluation of the Cohesion Policy and its impact on economy we may generally distinguish between macro-level models and analyses and micro-level models. While macro models usually deal with whole regions and their statistical indicators like regional GDP per capita growth, unemployment etc., the micro-models deal with the data related to particular agents in the region. It should be stressed that these two approaches are not competitive; on the contrary, they complement each other. Macro models in most cases focus on estimating the impact of the Cohesion Policy on regional convergence along with other issues like competitiveness, growth or unemployment. They are usually of econometric nature. Most of the papers listed above are examples of such an approach. Contemporary macro models can be divided into three basic groups. We find models dealing with panel data (like Ederveen et al. 2006), general equilibrium models – CGE and DSGE (Varga and Veld, 2009 for example) and also models employing Propensity Score Matching (PSM) or Regression Discontinuity Design (RDD) like in Becker et al (2008). There are several drawbacks of these macro models (see Wostner and Slander 2009) but the main liability of these models is often overlooked. It is the fact that these models rely on indicators either in constant prices or Purchasing Power Standard (PPS). However, such indicators do not reflect the real regional prices but use a sort of national average instead. As a result the regions are artificially

[1] There were several studies dealing with Cohesion Policy efficiency even before like de la Fuente and Vives (1995), but the data after 2000 were more abundant and reliable as Cohesion Policy had already two periods of existence.
[2] However, it is quite difficult to measure cohesion while measuring convergence in GDP per capita terms is quite easy, although not perfect.
[3] This is also argued by OECD (OECD 2007:129).

undervalued or overvalued in comparison to a real situation which may eventually lead to incorrect results of any research based on these data (Cadil, Mazouch 2011).

Microeconomic-based models are on the other hand focusing on individual data which are gathered from supported subjects (companies, NGO´s and public institutions). These models then analyze the impact of the Cohesion Policy on supported agents rather than on the region as a whole. Such approach was usually used only for creation of case studies and individual project evaluations. Their disadvantage is often seen in inability to deal with all spillover effects the Cohesion funding in the region brings (Bradley et al. 2006). However, it seems that using macro-models together with micro-data could be a possible way how to evaluate the impact of the Cohesion Policy with greater accuracy. The main advantage of utilizing the micro data is that it allows us to measure the real impact of the subsidy on a supported group of agents within the region. The regional price level affects all agents within the region similarly making them comparable. But the same is true for spillover effects mentioned as a liability above. This allows us to employ contrafactual models and techniques like RDD (Regression Discontinuous Design) and PSM (Propensity Score Matching) effectively. On the other hand such microeconomic-based models are extremely data demanding which often decreases their ability to be used widely in practice (Caliendo and Kopeinig 2005).

The purpose of this paper is to introduce preliminary results of our original research which focuses on micro-level evaluation of the Cohesion Policy impact on competitiveness and growth in the Czech Republic. As stated above such an approach is extremely data demanding. In this paper we show the first analytical outcomes from our data source which is quite complex, covering more than 22 000 subjects supported from Structural funds in period 2007–2013. We focus mainly on the territorial breakdown of financial means among supported agents. Our intention here is also to answer whether the regions, which are relatively lagging behind, really gained higher support or not. In other words, we analyze if the regions which are wealthier and institutionally better off do not eventually get more money than the poorer and less capable regions as Everdeen (2006) implicitly suggests.

2. Data and method

Our data source was created by merging two sources. The first basic source was the List of beneficiaries of the European Cohesion Policy in the Czech Republic between 2007 and 2013. It is published under the rules governing the implementation of the funds 2007–2013 (EC No 1828/2006) and contains the identification code (ICO), and name of the beneficiary, name of operation, fund and amount of public funding and the date of allocation. However, data important for further analysis like size, address of residence, legal form, status, date of activation, NACE and financial economic data are missing. Also the information about the place of realization of the supported project are not present in this source. Therefore we had to match the supported bodies to other database which contains almost all other information needed. We used Socio-demographic and financial information about subjects registered in Czech public registers (RES, ARES, OR, RŽP, ČSÚ, CICR, Justice) provided by Creditinfo solutions s.r.o. However, even when we have employed the other database, we still miss the place of realization of the project. This could be obtained from the Monitoring system. Unfortunately, this source is not accessible openly and, moreover, the database is not complete for the period 2007–2013 yet. We plan to involve the data from this system into our data source in future however.

It should be stressed here that although focusing on the place (region) of realization of the project might appear to be the right starting point for any analysis of Cohesion funding efficiency, the situation is not such straightforward. The problem is (and we clearly illustrate this in our results) that many projects are implemented by subjects that are not from the same region where the projects are placed. Although it is clear that the region where the project took place was supported we can also say that the region of the subject, which implemented the project, was supported. To give a hypothetical example – Construction Company from Hl. m. Praha builds a pavement in Pardubický NUTS 3 region under the Cohesion funding. This means that Pardubický region was supported as the pavement was built but also Hl. m. Praha was supported in a way as the company gets the money for building the pavement. This support bias is quite damaging from the analytical point of view. Especially if a researcher wants to compare the regions from the funds allocation point of view and answer questions regarding convergence or efficiency which is our intention in future. To deal with this problem at least partially and answer the question stated above – if relatively poorer regions gain relatively higher support – we had to reduce our sample. We decided to focus only on those projects which are implemented in the region and are likely to be implemented by local (regional) subject.

Naturally projects under Regional Operating Programmes met our condition best out of all Programmes so the data source was limited only on these projects for the last stage of this paper. It should be stressed however that even this reduction does not fully ensure that the projects are implemented by locals. It is because ROPs cover NUTS2 regions while we focus on NUTS3 regions and there is also a question of suppliers which cannot be detected.

3. Results

The total sum of allocated financial means from Structural funds and the Cohesion fund in period 2007–2013 reached 601.034 billion CZK in 12/2013. Financially most important programmes were so far Operating Programme Infrastructure (145 bil. CZK) and Regional Operation Programmes (106 bil. CZK). The whole Czech Republic in period 2007–2013 was supported under Objective 1 (Convergence) with one exception which was Hl. m. Praha. It should be stressed that most of the financial means were allocated on Objective 1 (730 mld CZK, 97 % of the total allocated sum. Then it could be expected that Hl. m. Praha would have gained less finance than other regions and have less projects as well. Figure 1 shows the number of projects in respect to place of realization on NUTS 3 level. We see that the number of projects located in Hl. m. Praha is truly lagging behind other regions.

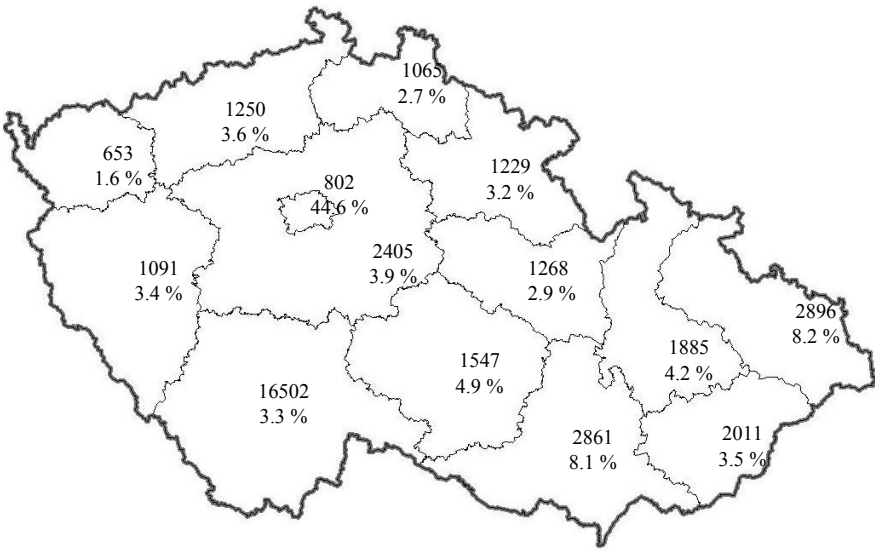

Fig. 1. The number of projects and recipients of amounts allocated by region in 2007–2013
Note: 2 % of the total amount is not known.
Source: http://www.mapaprojektu.cz/cs/index.shtlm, own calculation

However, from the micro-level database we used where we focus on the residence of the beneficiary, the outcome is quite different. As Figure 1 shows almost 40 % out of the entire budget went to Hl. m. Praha. Also other NUTS 3 regions with important local centres like Jihomoravský or Moravskoslezský region have a significantly higher share of allocated funds than others.

Of course this is quite a logical outcome as most of the public administration bodies (like ministries) reside in Hl. m. Praha and quite large proportion of Structural funds is devoted on them. Also big companies usually have their headquarters in Hl. m. Praha as well and big universities are located in the capital city. Although these institutions are distributing financial funds into other regions (according to projects they implement outside Hl. m. Praha) we see quite a huge territorial concentration of total funding at least from the plain accounting point of view. And as was mentioned above a question arises if these financial flows are not a sort of support as well. Table 1 illustrates the legal form breakdown of total SF funding where we can see several dominant legal forms. We see that public sector gains highly major part of SF financial support. However, we should assume that large part of

this bundle ends in the private sector as a supplier of public projects. Unfortunately, these secondary financial flows cannot be traced from any database and could be gathered only from particular project documentation. Again we may ask if such redistribution does not eventually distort the real SF means allocation.

Table 1. Allocated amount by legal form of the recipients

Legal form	Allocated amounts	Total allocated sum (%)
Joint-stock Company	66 645 797 271	11 %
Regions (NUTS3)	41 459 674 008	7 %
Municipality or City District of the Capital City Hl. m. Praha	78 613 325 369	13 %
State Organizational Body	58 608 173 992	10 %
Semi-budgetary Organization	143 030 236 624	24 %
Limited Liability Company	67 233 130 930	11 %
Railway Tracks Maintenance, State Organization	56 780 920 293	9 %
Public Research Institution	12 595 956 881	2 %
University	16 330 016 729	3 %

From the size of the beneficiary point of view we conclude that mainly big institutions were supported in Hl. m. Praha and regions with important local centres (figure 2). This is not surprising especially in the light of previous findings. On the other hand, in regions with more dispersed population we witness a higher portion of small and medium organizations supported.

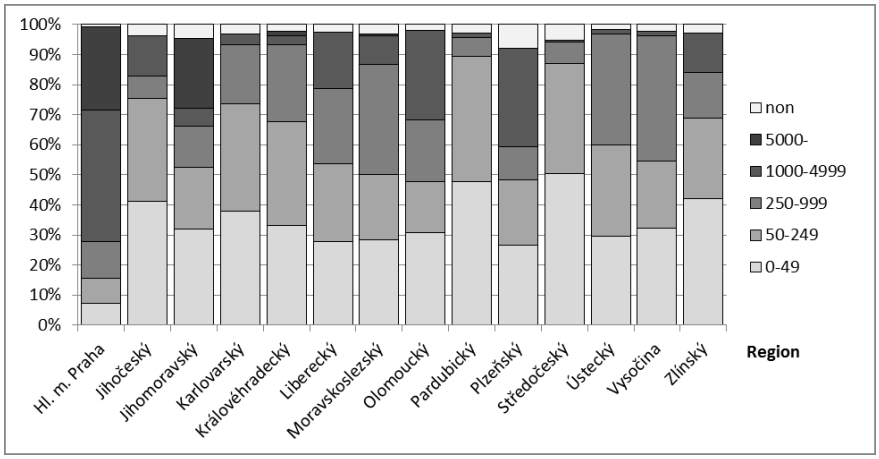

Fig. 2. Structure of allocated subsidies in the years 2007–2013 by region and number of employees of recipients.

Regarding the number of subjects supported and average and median value of financial means allocated for one subject we can see quite a large disproportion again (figure 3). We may conclude that the biggest number of supported subjects is in regions with important local centres again and in Hl. m. Praha. The exception is Plzeňský region where the number of supported subjects is surprisingly low. When we take a look at the average and median values we see that there are big differences and the allocation is highly skewed. Usually the regions with strong local centres have the highest skewness again but we may find several exceptions like Karlovarský region where the differences are also considerably big. This outcome is however quite logical. In regions like Hl. m. Praha we may expect beneficiaries who provide big projects of national importance which increase the average financial support greatly.

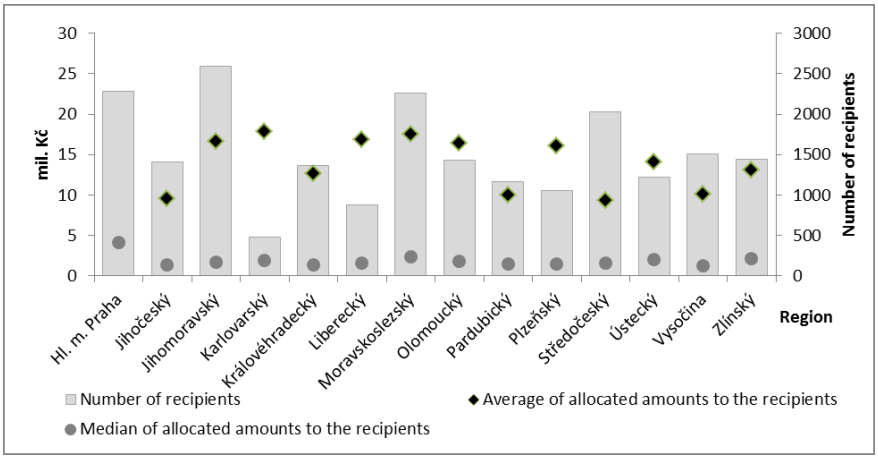

Fig. 3. Recipients of subsidies and amounts allocated by region in 2007–2013
Note: In the region Hl. m. Praha the average is 108.6 mil. CZK.

The last analytical outcome of this paper should answer the question if relatively poorer regions gain a relatively higher support via the Cohesion Policy. As repeatedly mentioned above this question is not easy to be answered if we take all factors into consideration. Although we tried to at least control the data for territorial affiliation of beneficiary and the place of project implementation using ROP projects only, we cannot control for beneficiary´s suppliers which can be from anywhere. Moreover, we found out that a low share of projects financed by ROPs were again implemented by subjects from Hl. m. Praha (approx. 2.5 % of each ROP). On the other hand, the same can be said about most of the other NUTS3 beneficiaries. The ratio is however quite small so we may neglect it. Comparing the GDP per capita in PPS in 2007 as a standard indicator of economic development of the region and the ROP financial means allocated for the region (beneficiary´s NUTS3 level) we get results in Figure 4.

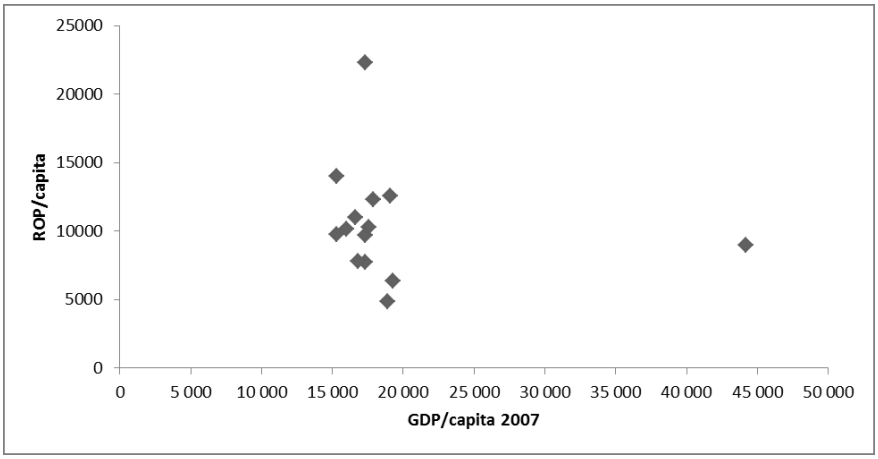

Fig. 4: Relationship ROP and GDP in the regions
Source: own data source, EUROSTAT, own calculation

We can see that there is a possible relation between allocated ROP financial means and initial GDP per capita level. Using Pearson´s correlation coefficient we get correlation of 0.47. However, we have two possible outliers in the graph – Hl. m. Praha and Vysočina. Hl. m. Praha has a considerably smaller ratio of per capita ROP support to

per capita GDP simply because it does not have ROP in fact and should be removed from the sample anyway. The amount of ROP/capita we got here is resulting from the fact that Hl. m. Praha subjects are implementing projects under various ROPs around the country. On the contrary, Vysočina has considerably higher ROP/capita in comparison to others. Removing these two outliers yields a lower correlation coefficient of 0.31. We may (weakly) conclude that less developed regions really gain more financial means than more developed through Regional Operating Programmes.

4. Conclusion

The Cohesion Policy is one of the most important policies in the EU offering a considerably high amount of financial means. One of the crucial goals of the Cohesion Policy is to speed up the convergence process among the EU countries and regions. This means mainly to support the regions which are lagging behind. However, the question of effectiveness of the Cohesion Policy and its real impact on convergence and regional growth is still unsettled. There have been dozens of attempts to evaluate and analyze the impact of Structural funds ending with opposite conclusions. On one hand this unsettled situation can be caused by different methods which are being used. For example, panel data approaches usually (but not always) yield negative results while CGE/DSGE models and case studies yield usually positive results regarding the Cohesion Policy efficiency. On the other hand, the main problem may lay in data that are being used. To properly analyze if the policy is effective we mainly need reliable data to work on. As we have shown in this article there is no such database so far and we face many problems regarding the data which are available. For example, we know the sum which was allocated to a beneficiary but we do not have the data about its suppliers. Moreover, we may ask who is finally supported – the beneficiary is supported for sure but the subject which implements the project is supported in a way too. And if the subject is from a different region then this other region is supported as well.

As a part of our starting research project we developed a new data source by merging two accessible databases. Our data source allows us to at least partially deal with the problems mentioned above. It is still in a development process and misses some important features like place of implementation of the project. However, even the preliminary results are quite promising. For the case of the Cohesion Policy in the Czech Republic we found several interesting facts so far. We may conclude that a large ratio of the financial means (40 %) goes to Hl. m. Praha from where it is distributed around the Czech Republic. In other words, many projects which are carried out in the Czech Republic are implemented by subjects located in Hl. m. Praha (public administration bodies, universities, big companies). This arise a question if Hl. m. Praha is not after all an important indirect beneficiary of the Cohesion Policy. Regarding the legal forms the public administration bodies are major recipients followed by joint stock and limited liability companies. The major problem is that public institutions are usually not those who implement the projects at the end but it is impossible (without dealing directly with a particular project documentation) to find out the final receiver of the support. Regarding the size of a beneficiary we conclude that in more urbanized regions with big centers like Hl. m. Praha or Moravskoslezský region there is a considerably higher ration of big subjects supported. In regions with more dispersed population the beneficiaries tend to be smaller in size. Consequently we found out that the distribution of financial means is highly skewed – there are big differences between average and median support per subject. The highest difference is in Hl. m. Praha where subjects dealing with projects of national importance are located.

One of the goals of this article was also to answer the question if less developed regions gain higher support via the Cohesion Policy than more developed regions. Unfortunately, we were forced to reduce our dataset greatly mainly to control for location of the beneficiary and the place of project implementation. We did this by focusing only on the second most important part of the Cohesion Policy in the Czech Republic performed by Regional Operating Programmes. After the removal of Hl. m. Praha we got a result which supports, albeit weakly, the hypothesis that less developed regions gain higher financial support. In our further research we intend to develop our data source further and to focus on running methods like RDD on these data to evaluate the Cohesion Policy effectiveness.

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